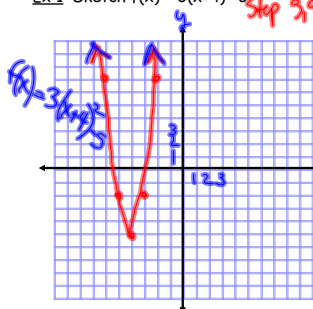
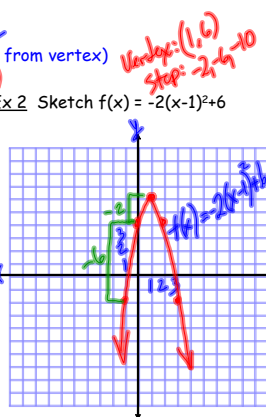
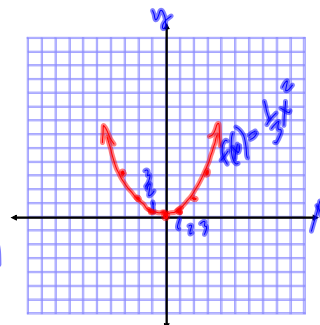


## 1.7 More Transformations

More Graphing: (by using step pattern from vertex)

Ex 1 Sketch  $f(x) = 3(x+4)^2 - 5$ Vertex:  $(-4, -5)$   
Step: 3, 9, 15Ex 2 Sketch  $f(x) = -2(x-1)^2 + 6$ 

More Graphing: (by using step pattern from vertex)

Ex 3: Sketch  $f(x) = \frac{1}{3}x^2$ Vertex:  $(0, 0)$   
Step:  $\frac{1}{3}, 1, \frac{5}{3}$   
Compression

State an Equation given the Graph:

Easiest to state the equation in  $f(x) = a(x-h)^2+k$  form if you can see the vertex.

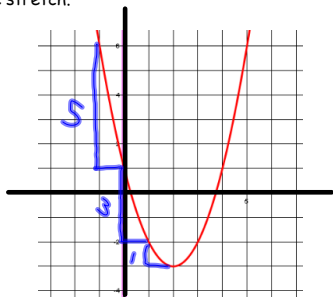
1. Find the vertex  $(h, k)$
2. Find "a" - decide if pos or neg from direction of opening then count the stretch.

State an equation for each of the following:

Ex 1:

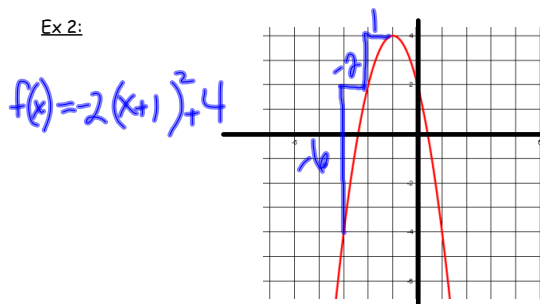
 $(2, -3)$ 

$$f(x) = (x-2)^2 - 3$$



State an Equation given the Graph:

Ex 2:

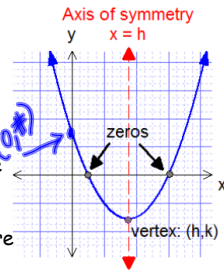


Can't count the stretch....What do I do???

Find an equation of the parabola that has a vertex of  $(3, -2)$  and has an x intercept of 5

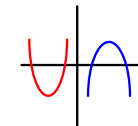
Features of Quadratics

- The vertex of a parabola is either the minimum point (opens up) or maximum point (opens down).
- A vertical line of symmetry which goes through the vertex is called the axis of symmetry.
- The x-intercept(s) of a parabola are called its zeros or roots.
- The vertical intercept (the y intercept) is the value of y when x=0 ie. f(0)

The Number of zeros: x intercepts, solutions, roots

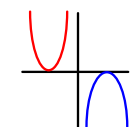
State the Number of zeroes:

a) From the graph:



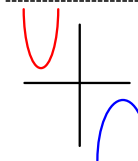
Direction of opening: up  
 vertex above or below axis: below  
 # of zeros: 2

Direction of opening: Down  
 vertex above or below axis: above  
 # of zeros: 2



Direction of opening: up  
 vertex above or below axis: on  
 # of zeros: 1

Direction of opening: Down  
 vertex above or below axis: on  
 # of zeros: 1



Direction of opening: up  
 vertex above or below axis: above  
 # of zeros: none

Direction of opening: Down  
 vertex above or below axis: below  
 # of zeros: none

Max/Min and the Number of zeros:

From the Equation:

$y = 3(x+7)^2 - 5$

Direction of opening: up  
 vertex above or below axis: below  
 # of zeros: 2  
 Max/min: min  
 occurs when: -5

$y = -(x+2)^2$

Direction of opening: Down  
 vertex above or below axis: on  
 # of zeros: 1  
 Max/min: max  
 occurs when: 0

$y = 2(x-4)^2 + 8$

Direction of opening: up  
 vertex above or below axis: above  
 # of zeros: none  
 Max/min: min  
 occurs when: +8

work break ....

p47 # 1 State the number of zeros given the graph

# 2 State the number of zeros, max/min and when it occurs given the equation

We will take this up as a class in 10 min

Stating the vertical intercept

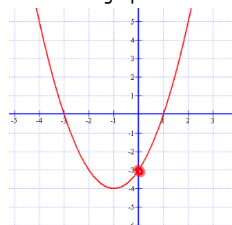
$f(x) = 3(x-2)^2 - 5$

$$\begin{aligned} \text{y-intercept Set } x=0 \\ &= 3(0-2)^2 - 5 \\ &= 3(4) - 5 \\ &= 12 - 5 \\ &= 7 \end{aligned}$$

$\therefore$  the y-intercept is 7

Stating the Zeros

From a graph:



From an equation in VERTEX form:

$$\begin{aligned} f(x) &= -4(x+3)^2 - 8 \\ &= -44 \end{aligned}$$

~~$f(x) = 3(x-2)^2 - 5$~~

Hmwk p 56 # 3 - 5, 7

p 204 # 5 (using algebra), 8 ab, 9ab